In Phase I of the project, our primary goals were to use and test all of the functional requirements created in the final version of the University of Pittsburgh model. However, this is not to say that we were committed to retaining all the requirements, if we had good reasons for revising or eliminating any of them. The goals were to make the model easier to use and more cost effective without sacrificing in any way the integrity of the model. On the basis of field tests, we made some modifications in the Pitt model. We retained all of the functional requirements at the highest level: Conscientious Organization, Accountable Recordkeeping System, Captured Records, Maintained Records, and Useable Records. However, we eliminated or moved categories at the sub-requirements level, renamed several requirements, and moved one requirement to a different category. What follows is a brief description of the specific changes we made and a rationale for why we made them.

We have always felt there was some unnecessary overlap between the functional and metadata requirements in the Pitt model. Over the course of three field tests we identified three requirements - Complete, Auditable and Meaningful - which we believed dealt exclusively with the existence of appropriate metadata and could be examined when we reviewed the metadata requirements. Consequently, we eliminated these requirements from the functional requirements section. We also eliminated three requirements which we felt were unnecessary or redundant. These included Identifiable, Implemented, and Communicated. We renamed three requirements with the intent of making them more descriptive. These included: Authentic renamed as Authorized, Credible renamed as Accurate/Consistent, and Sound renamed as Inviolate. By combining the requirements of accurate and consistent, we eliminated the separate requirements under these names and moved the single requirement for Accurate/Consistent records into the category of Capture Records. In the final draft of our version of the functional requirements document, we include thirteen requirements. The final version of the Pitt model includes nineteen requirements.

Another major revision we made in the Pitt functional requirements document was to rewrite the narrative statement for each requirement with the intent of making it easier to read and use. This meant stating the intent of the function more succinctly and rewriting the statements in what we thought was a clearer, more straightforward narrative. We also thought the explanation of the requirement would be more useful if stated in the form of a question or a series of questions. The questions we developed were drawn directly from the longer narrative description of the requirement created by Pitt Project personnel.

In phase II of the project, we determined that reviewing and refining our functional requirements statement was an essential goal. Experience has shown that before we can begin to talk with IT personnel and others about what records management strategies, we first needed to define what types of functionality a recordkeeping system should possess.
If the archivist cannot answer this question with a list of requirements or specifications, the dialogue and potential partnership will end very quickly. Consequently, I felt we needed to spend considerable time during the project creating the best set of requirements possible that outlined how we wanted the system to manage records.

A big difference from phase I to phase II is that we had available to us many more lists of recordkeeping requirements and metadata specifications. Unfortunately, the various lists of recordkeeping requirements differ, in some cases significantly, and no one list has been endorsed by the profession. There is general agreement and a growing consensus, however, on several critical points. For example, the majority of archivists agree that "not all information systems are recordkeeping systems," and that "recordkeeping systems are a special kind of information system." (David Bearman) Most of the lists of recordkeeping requirements also agree on the basic types or categories of functionality a recordkeeping system must possess. These typically include requirements that the system be compliant by meeting legal and administrative requirements, national and international standards, and best practices for recordkeeping. Many lists of recordkeeping requirements also specify that the system be accountable and reliable. Specific requirements included in this category are that system policies and procedures be well documented, that system hardware and software be regularly tested to ensure that consistent and accurate business records are created, and that system audit trails be maintained for all business processes. All lists of requirements specify that the system capture all business records and all essential metadata related to that business process. Similarly, all lists of recordkeeping system requirements mandate that the system maintain and manage the business record. Typical requirements in this category include the specifications that the system maintain immutable records protected from accidental or intentional deletion or alteration; that the system ensure that all components of a record, including relevant metadata, notes, attachments, etc., can be accessed, displayed and managed as a unit or complete record of a business process; and that the system include an authorized disposition plan that is implemented as needed. Finally, all sets of requirements specify that the recordkeeping system ensure the future usability of the business records. As part of this requirement, systems must be capable of recreating the content of records and any relevant metadata within a new system without loss of any vital information.

We reviewed all the prominent lists of functional requirements, but were most influenced by the lists produced in the "Model Requirements for the Management of Electronic Records" (MoReq) created for the IDA Programme of the European Commission and by the National Archives of Australia. In phase II we produced three different but related versions of functional requirements.

**Year 2000 version of the IU Functional Requirements:** The list produced in 2000 was very similar to the list of requirements created at the end of Phase I in 1997-98. The primary categories in both lists specified that the system be compliant and that records in the system be reliable, captured, maintained and useable. One of the major differences between the phase I requirements document and the 2000 version was that we began to generate requirements in 2000 that were more in our own language and less in the
language of the Pitt document. In essence, we were gaining the knowledge and the confidence to express these requirements in our own terms. We also consolidated and rearranged some of the sub-headings in the 1997-98 document in an attempt to make the new version more readable and less confusing and fragmented.

**Year 2001 version of the IU Functional Requirements:** With this version, we began the process of making the requirements statement more detailed and defined. We determined that our primary goal was to tell system designers what types of functionality need to be created or designed into the system. Although we were not attempting to tell system designers how to translate these requirements into automated solutions, our requirements must eventually include enough specificity to achieved the results we sought. In this 2001 version, we added requirements related to the desirability of capturing records in an automated workflow process and maintaining a logical relationship between the record and the business transaction that created it. We also decided to add a separate set of requirements on the retention and disposition of records, rather than just a single specification under the requirement “Maintained.”

**Year 2002 version of the IU Functional Requirements:** This version incorporated radical changes into our set of requirements. The document reflected my sense that we needed a much more detailed and specific set of requirements if we wanted to produce a useful document that would truly inform system designers. For phase I and much of phase II, a major concern was to simplify and produce a readable document. I feared that producing a lengthy and complex set of requirements would turn off potential partners and cause the document to never be read and acted upon. I am still concerned about this, but now this concern translates into a strategy for not including extraneous or frivolous requirements. I have become convinced that adding more explanation on primary requirements is absolutely necessary. I believe we cannot just sketch out requirements; we must provide designers sufficient information to understand the requirement fully so that they will be able to create specific design features that will satisfy the requirement. In this document, I was strongly influenced by the MoReq’s list of requirements.

Where are primary changes in the 2002 version? For starters, we greatly expanded the section on record and metadata capture. To me the capture issue is one of the greatest challenges facing recordkeepers, largely because existing systems do such a poor job in this area. If we are going to have recordkeeping systems that capture records, we will need to define very specific requirements on this issue. The IU 2002 requirements statement attempts to address this issue by defining the term capture much more specifically. In this new version, capture represents “the processes of registering a record, deciding which class it should be classified to, adding further metadata to it, and storing it in the ERMS.” (MoReq) We also emphasize that the capture function be automated or concurrent with the automatic creation of records.

Because of the importance of classifying the document, I added in this version a new section on classification schemes. The value of classification in automated systems addresses my continuing concern about the level of analysis, and how one can represent and appraise electronic records at the class/record series or file level. I and other
commentators on electronic records management have recognized that archivists cannot afford to analyze electronic records routinely at the item or record level. We need to find a way, just as in paper systems, for making decisions at the aggregate level. But how do we this in automated systems that normally fragment records into discrete bits of data stored in tables? The solution is to capture records at the point of creation and to associate that record with some kind of classification scheme, preferably one based on business processes. Only in this way can we hope to associate a record with an activity or function and begin to aggregate individual records into logical relationships that resemble record series.

Another new section in the 2002 IU functional requirements statement deals with the creation and capture of system audit trails. Only in the last year or so have I come to truly understand what audit trails represent and how they differ from other metadata. In essence audit trails document the activities performed on records and their metadata from creation to disposal. As such, audit trails are essential to establishing the authenticity and reliability of records. The 2002 functional requirements document reflects this importance by the addition of eight requirements on the creation, capture and management of audit trails. A requirement that demands special recognition is the one that specifies that the system automatically capture audit trail metadata. If we have to rely on manual intervention to capture audit data, I think the requirement will not be met. Another issue is how much audit trail information to collect. As we state in our requirements statement, the volume of audit trail data can get very large, very quickly. Consequently, it is important to review and carefully determine which audit trail data will be collected and why. We think there is a minimum set of audit information, which must include information on which records were added, deleted, modified or accessed, by whom and when. Beyond that I believe each institution must make its own determinations. Very likely this decision will be made according to the requirements of each system, and to the risks of collecting or not collecting more extensive audit trail data.

Another new section in the 2002 version is on preservation strategies. We felt it was important, just as with disposition schedules, to call attention to this issue by making it a separate section with its own set of requirements. We also wanted to use this section to make important distinctions between preservation strategies and “back-up” procedures.

Finally, we added a section at the end of the 2002 version of the IU functional requirements on integrating strategies for managing electronic and non-electronic records. Clearly, the goal of any records management program is to apply the basic requirements to all records no matter what the format. Our new statement requires that this integration of electronic and physical records be designed into the system.

The requirements specified in the 2002 document represent our best thinking at present on this issue. There is not doubt, however, that the requirements statement will change and continue to evolve. In particular, I believe I will be adding more specificity and more detail to the basic requirements.